

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

---

Ex parte DONALD J. WILLIAMS, JAMES A. WAFER, MARIELLE PIRON,  
and MICHAEL L. MCCLELLAND

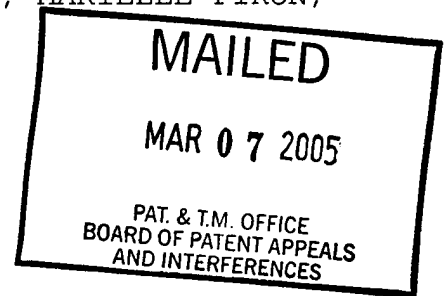
---

Appeal No. 2005-0648  
Application No. 09/824,980

---

ON BRIEF

---



Before KIMLIN, GARRIS, and OWENS, Administrative Patent Judges.  
GARRIS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal which involves claims 1-23.

The subject matter on appeal relates to an electric power steering system for a vehicle. With reference to the appellants' drawing, the electric power steering system 12 comprises a steering wheel 16, a steering shaft 20, and a switched reluctance motor 32 which includes a stator 114 having a plurality of circumferentially-spaced stator segment assemblies 118 that include a stack of stator plates 126 forming a stator segment

Appeal No. 2005-0648  
Application No. 09/824,980

core 120 and winding wire 124 wound around the stator segment core, wherein the switched reluctance motor further includes a rotor 116 defining a plurality of rotor poles 156 and a drive circuit 56 that energizes the winding wire around the stator segment assemblies based on a rotational position of the rotor. This appealed subject matter is adequately represented by independent claim 1 which reads as follows:

1. An electric power steering system for a vehicle comprising:

a steering wheel;

a steering shaft connected to said steering wheel;  
and

a switched reluctance motor coupled to said steering shaft for reducing driver effort that is required to turn said steering wheel, wherein said switched reluctance motor includes a stator including a plurality of circumferentially-spaced stator segment assemblies that include a stack of stator plates forming a stator segment core and winding wire wound around said stator segment core, a rotor defining a plurality of rotor poles, wherein said rotor tends to rotate relative to said stator to maximize the inductance of an energized winding, and a drive circuit that energizes said winding wire around said stator segment assemblies based on a rotational position of said rotor.

The prior art set forth below is relied upon by the examiner as evidence of obviousness.

Mitsui	4,149,309	Apr. 17, 1979
Kliman et al. (Kliman)	4,896,089	Jan. 23, 1990
McCann	5,691,591	Nov. 25, 1997
Trago et al. (Trago)	6,020,661	Feb. 1, 2000

Appeal No. 2005-0648  
Application No. 09/824,980

Nishiyama et al. (Nishiyama)	6,049,153	Apr. 11, 2000
Ackermann et al. (Ackermann)	6,389,678	May 21, 2002

The admitted prior art described on page 4 of the subject specification.

Under 35 U.S.C. § 103(a):

Claims 1-5 and 8 are rejected as being unpatentable over Kliman in view of the admitted prior art and further in view of Nishiyama;

Claim 6 is rejected over Kliman, the admitted prior art and Nishiyama as applied above and further in view of Trago;

Claim 7 is rejected over Kliman, the admitted prior art and Nishiyama as applied above and further in view of Mitsui;

Claims 9-13, 16-19, 22 and 23 are rejected over Kliman, the admitted prior art and Nishiyama as applied above and further in view of McCann and Ackermann;

Claims 14 and 20 are rejected over Kliman, the admitted prior art, Nishiyama, McCann and Ackermann as applied above and further in view of Trago; and

Claims 15 and 21 are rejected over Kliman, the admitted prior art, Nishiyama, McCann and Ackermann as applied above and further in view of Mitsui.

On pages 3-4 of the brief, the appellants indicate that certain claims are grouped separately from the others. We will individually consider these separately grouped claims to the extent that they also have been separately argued. See In re Dance, 160 F.3d 1339, 1340 n.2, 48 USPQ2d 1635, 1636 n.2 (Fed. Cir. 1998). Also see Ex Parte Schier, 21 USPQ2d 1016, 1018 (Bd. Pat. App. & Int. 1991); current regulation 37 CFR § 41.37(c)(1)(vii) (September 2004); and former regulation 37 CFR § 1.192(c)(7) (2003).

We refer to the brief and reply brief and to the answer for a complete exposition of the opposing viewpoints expressed by the appellants and by the examiner concerning the above noted rejections.

#### OPINION

We will sustain each of these rejections for the reasons well stated by the examiner in his answer. We add the following comments for emphasis and completeness.

#### THE REJECTION OF CLAIMS 1-5 AND 8 OVER KLIMAN, THE ADMITTED PRIOR ART AND NISHIYAMA

As correctly observed by the examiner, Kliman discloses a switched reluctance motor for use in an automotive power steering system (e.g., see the abstract and lines 36-37 of column 2).

Appealed independent claim 1 distinguishes from Kliman, inter alia, by requiring that the stator of the here claimed switched reluctance motor comprises a plurality of circumferentially-spaced stator segment assemblies that include a stack of stator plates forming a stator segment core and winding wire wound around the stator segment core. In patentee's switched reluctance motor, the stator is disclosed simply as comprising a laminated iron stator rather than a plurality of circumferentially-spaced stator segment assemblies as defined by appealed claim 1. According to the examiner, "[i]t would have been obvious to modify Kliman by making the stator of segment assemblies having the shape taught by Nishiyama so that the winding may be formed easily (col. 4, line 49)" (answer, page 4).

The appellants' nonobviousness position is focused on the examiner's above proposed combination of Kliman and Nishiyama. In the appellants' view, this combination would not have been obvious because Kliman is directed to a switched reluctance motor wherein a drive circuit energizes the stator windings as a function of the sensed rotor position whereas Nishiyama is directed to a synchronous reluctance motor wherein the windings are energized at a controlled frequency. In this regard, the appellants contend that switched reluctance motors with non-

segmented stators have been known in the prior art since the mid 1800's and that permanent magnet motors with segmented stators of the type taught by Nishiyama have been known in the prior art since the early 1950's. The appellants further contend that nonobviousness is evinced by the age of this prior art coupled with the failure to solve the problem of more cost effective power steering systems of the type here claimed (e.g., see the paragraph bridging pages 4 and 5 of the reply brief).

This argument by the appellants is unpersuasive. Significantly, the appellants have advanced no technical reason (and we independently perceive none) which would have discouraged an artisan from providing Kliman with a segmented stator in order to obtain the advantages (easily formed winding) taught by Nishiyama. As for the appellants' contentions regarding the age of switched reluctance motors with non-segmented stators versus synchronous motors having segmented stators of the type taught by Nishiyama, we reiterate the examiner's well taken point that prior art age is not particularly relevant to the issue of obviousness versus nonobviousness in the absence of evidence that artisans have tried and failed to solve some problem notwithstanding their presumed knowledge of this prior art. See In re Wright, 569 F.2d 1124, 1127, 193 USPQ 332, 335 (CCPA 1977) and

In re Neal, 481 F.2d 1346, 1347, 179 USPQ 56, 57 (CCPA 1973).

The appellants seem to believe that nonobviousness is reflected on the record of this appeal by virtue of "the age of the references coupled with the failure to solve the problem (i.e., more effective power steering systems) in light of the presumed knowledge of the references" (reply brief, page 4). However, the record before us contains no evidence of "the failure to solve the problem (i.e., more effective power steering systems)" (id.).

For the reasons set forth above and in the answer, we are convinced that the examiner has established a prima facie case of obviousness with respect to appealed independent claim 1 which the appellants have failed to rebut with argument or evidence of nonobviousness. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). We hereby sustain, therefore, the examiner's Section 103 rejection of independent claim 1 and of nonargued dependent claims 2-5 and 8 as being unpatentable over Kliman in view of the admitted prior art and further in view of Nishiyama.

THE REJECTION OF CLAIMS 9-13, 16-19, 22 AND 23 OVER THE ABOVE  
DISCUSSED REFERENCES AND FURTHER IN VIEW OF MCCANN AND ACKERMANN

As acknowledged by the examiner, Kliman and Nishiyama do not disclose the requirement of appealed independent claims 9 and 16

wherein the stator segment core and winding wire define a slot fill between 70 and 95 percent. Regarding this deficiency, the examiner indicates that McCann evinces the desirability of increased slot fill in a switched reluctance motor (e.g., see lines 55-67 in column 5) and that Ackermann teaches induction motor slot fills approaching 70 percent are common (see lines 15-16 in column 2). Under these circumstances, the examiner concludes that it would have been obvious for an artisan to provide the modified Kliman motor with a slot fill of 70 percent or above in order to obtain the art recognized benefits of increased slot fill based on the teachings of McCann and Ackermann.

The appellants argue that the examiner's obviousness conclusion is improper because "neither McCann or Ackermann show, teach or suggest a switched reluctance electric machine with a segmented stator and with a slot fill of 70-95 percent" (brief, page 10; also see page 9 of the reply brief). The infirmity of this argument is that it is focused on the deficiencies of the applied references considered individually. It is well settled, however, that, where (as here) a rejection is based on a combination of references, nonobviousness cannot be shown by attacking the references individually. In re Keller, 642 F.2d



413, 426, 208 USPQ 871, 882 (CCPA 1981). This is because the test for obviousness is what the combined teachings of the references would have suggested to those of ordinary skill in the art. Keller, 642 F.2d at 426, 208 USPQ at 881.

Here, the combined teachings of McCann and Ackermann reflect that increased slot fill was recognized in the prior art as being desirable in the context of switched reluctance motors (see McCann) and that slot fills approaching 70 percent were common in the prior art of induction motors (see Ackermann). In light of these teachings, we are convinced that it would have been obvious for an artisan to provide the modified switched reluctance motor of Kliman with a slot fill of 70 percent or higher. From our perspective, this provision would have constituted simply the determination of a workable or optimum range for a parameter (i.e., slot fill) recognized in the prior art as being result effective (i.e., desirable). See In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (CCPA 1976); In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980); In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Under the circumstances recounted above and set forth in the answer, we again reach the ultimate determination that the

examiner has established a prima facie case of obviousness with respect to appealed independent claims 9 and 16 which the appellants have failed to successfully rebut with argument or evidence of nonobviousness. Oetiker, 977 F.2d at 1445, 24 USPQ2d at 1444. It follows that we also hereby the examiner's Section 103 rejection of these independent claims and of nonargued dependent claims 10-13, 17-19, 22 and 23 as being unpatentable over Kliman, the admitted prior art and Nishiyama in view of McCann and Ackermann.

THE REJECTION OF CLAIMS 6, 14 AND 20 OVER THE PRIOR ART DISCUSSED  
ABOVE AND FURTHER IN VIEW OF TRAGO

It is the examiner's fundamental position that it would have been obvious for an artisan to provide the modified switched reluctance motor of Kliman with an end cap arrangement of the type taught by Trago in order to protect the stator. We agree. The appellants argue that "Trago . . . fails to teach or suggest end caps and retainer sections for individual stator segment cores of a stator" because "[t]he disclosure of Trago . . . is limited to a single-piece stator (see Figure 7) and motor housing end caps (25, 26) that house the motor components" (brief, page 12). This argument is unconvincing because it is implicitly premised upon an incorrect test for obviousness. Contrary to the

Appeal No. 2005-0648  
Application No. 09/824,980

appellants' apparent belief, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. Nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, as previously explained, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. Keller, 642 F.2d at 425-26, 208 USPQ at 881.

In light of the foregoing and for the reasons expressed in the answer, we hereby sustain the examiner's Section 103 rejections of claim 6 over Kliman, the admitted prior art and Nishiyama in view of Trago and of claims 14 and 20 over Kliman, the admitted prior art, Nishiyama, McCann and Ackermann in view of Trago.

Appeal No. 2005-0648  
Application No. 09/824,980

THE REJECTIONS OF CLAIMS 7, 15 AND 21 OVER THE REFERENCES  
DISCUSSED ABOVE AND FURTHER IN VIEW OF MITSUI

On the record of this appeal, these rejections have not been contested by the appellants. Again see Dance, 160 F.3d at 1340 n.2, 48 USPQ2d at 1636 n.2. As a consequence, we additionally hereby sustain the examiner's Section 103 rejections of claim 7 over Kliman, the admitted prior art and Nishiyama in view of Mitsui and of claims 15 and 21 over Kliman, the admitted prior art, Nishiyama, McCann and Ackermann in view of Mitsui.

Appeal No. 2005-0648  
Application No. 09/824,980


SUMMARY

The decision of the examiner is affirmed.

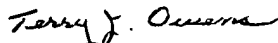
No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

  
EDWARD C. KIMLIN )  
Administrative Patent Judge )

  
BRADLEY R. GARRIS )  
Administrative Patent Judge )

BOARD OF PATENT  
APPEALS AND  
INTERFERENCES

  
TERRY J. OWENS )  
Administrative Patent Judge )

BRG:hh

Appeal No. 2005-0648  
Application No. 09/824,980

HARNESS, DICKY & PIERCE, P.L.C.  
P.O. BOX 828  
BLOOMFIELD HILLS, MI 48303